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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/628,330	07/29/2003	Satoshi Miura	03131	6093

23338 7590 12/04/2006  
DENNISON, SCHULTZ & MACDONALD  
1727 KING STREET  
SUITE 105  
ALEXANDRIA, VA 22314

EXAMINER
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VERDIER, CHRISTOPHER M

ART UNIT	PAPER NUMBER
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3745

DATE MAILED: 12/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

8

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/628,330	MIURA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Christopher Verdier	3745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 November 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3,6-15 and 18-22 is/are pending in the application.
- 4a) Of the above claim(s) 7-9 and 18-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,6,10-15 and 21-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 7-29-03, 1-17-06 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11-9-06</u> .   | 6) <input type="checkbox"/> Other: _____                          |

***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on November 9, 2006 has been entered.

The indicated allowability of claims 1-3, 6-15, and 21-22 is withdrawn in view of the newly discovered reference(s) to European Patent 909,897. Rejections based on the newly cited reference(s) follow.

Applicant's election without traverse of Species I, figures 1-13 in the reply filed on July 28, 2005 is acknowledged.

Claims 7-9 and 18-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3, 6, 10-11, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' Admitted Prior Art Figures 23-24 in view of European Patent 909,897 and Fuji 6,336,788. Applicants' Admitted Prior Art Figures 23-24 (AAPA Figures 23-24) discloses an impeller pump for a fluid substantially as claimed, including a rotary impeller 110, a pump casing 104 defining a first pump channel 151 and a second pump channel 171, wherein the rotary impeller is disposed within the pump casing and opposes to the first pump channel and the second pump channel, respectively, a convergence device (the unnumbered channel within which the impeller rotates) arranged and constructed to converge the fluid discharged from the first pump channel and the fluid discharged from the second pump channel. The pump casing further defines a first discharge port 153 and a second discharge port 173 respectively communicating with the first pump channel 151 and the second pump channel 171 and formed

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separately from each other, so that the fluid is discharged from the first and second channels via the respective first and second discharge ports and is converged at the convergence device. The rotary impeller has a first surface and a second surface opposing to each other, each of the first and second surfaces includes a plurality of grooves 112 arranged in a circumferential direction of the impeller and spaced from each other by a predetermined pitch, the grooves in the first surface and the grooves in the second surface being disposed at the same positions in the circumferential direction of the impeller, with the first pump channel opposing the grooves of the first surface of the impeller, the first pump channel communicating with a first suction port 152 and a first discharge port 153, and the first suction port and the first discharge port are separated from each other by a first partition wall 105a, the second pump channel opposes the grooves of the second surface of the impeller, the second pump channel communicating with a second suction port 172 and a second discharge port 173, and the second suction port and the second discharge port are separated from each other by a second partition wall 107a, the convergence device comprising a convergence channel communicating with the first discharge port and the second discharge port, so that the fluid discharged from the first discharge port and the fluid discharged from the second discharge port converge at the convergence channel. The first discharge port and the second discharge port are disposed at the same position in the circumferential direction of the impeller. The first pump channel and the second pump channel include unnumbered terminal ends that communicate with the first discharge port and the second discharge port, respectively, and an unnumbered motor section that rotates the impeller.

However, AAPA Figures 23-24 does not disclose a pulsation canceling device arranged and constructed to cancel pulsations of the fluid discharged from the first pump channel and the second pump channel, respectively (claim 1), does not disclose an impact reducing device arranged and constructed to reduce impacts produced by at least one of the flow of the fluid from the first pump channel and the flow of the fluid from the second channel (claim 1), does not disclose that the pulsation canceling device is arranged and constructed to displace the first discharge port from the second discharge port by a distance corresponding to half the predetermined pitch of the grooves of the impeller (claim 1), does not disclose the pulsation canceling device being arranged and constructed to cancel pulsations of the fluid discharged from the first discharge port and the second discharge port (claim 2), does not disclose the impact reducing device is arranged and constructed to reduce impacts of the fluid caused by change of direction of at least one of a flow of the fluid discharged from the first pump channel toward the first discharge port and a flow of the fluid discharged from the second pump channel toward the second discharge port (claim 2), does not disclose that the pulsation canceling device is arranged and constructed to shift a phase of the pulsation of the fluid discharged from the first discharge port from a phase of the pulsation of the flow of the fluid discharged from the second discharge port (claim 3), does not disclose that each of the terminal ends has a part opposing to the grooves defined in the corresponding one of the first and second surfaces of the impeller such that the impact reducing device is arranged and constructed to gradually reduce a sectional area of the part of the terminal end in the rotational direction of the impeller (claim 6), does not disclose that the impact reducing device comprises a depth decreasing region disposed at one of the terminal ends of the first and second pump channels, with the depth decreasing region

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configured to gradually reduce the depth of the part of at least one of the terminal ends in the rotational direction (claim 10), and does not disclose that the depth decreasing region comprises an inclined surface opposing to the grooves defined in the corresponding ones of the first and second surfaces of the impeller, with the inclined surface being inclined in the rotational direction of the impeller (claim 11).

European Patent 909,897 (figures 1-8) shows a regenerative channel pump having a pulsation canceling device arranged and constructed to cancel pulsations of fluid discharged from a first bottom pump channel 32 and a second top pump channel 33, with the pulsation canceling device being arranged and constructed to displace a first discharge port 32a from a second discharge port 33a by a distance corresponding to half a predetermined pitch of grooves 26 of an impeller 20, for the purpose of reducing pulsations and noise.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the impeller of AAPA Figures 23-24 such that the first discharge port is displaced from the second discharge port by a distance corresponding to half the predetermined pitch of the grooves of the impeller, as taught by European Patent 909,897, for the purpose of reducing pulsations and noise. This modification would inherently result in the cancellation of pulsations of the fluid discharged from the first discharge port and the second discharge port, and the shifting of a phase of the pulsation of the fluid discharged from the first discharge port from a phase of the pulsation of the flow of the fluid discharged from the second discharge port.

Fuji '788 (figures 1-7) shows a regenerative channel pump having an impact reducing device 24f arranged and constructed to reduce impacts produced by flow of the fluid from a first pump channel 21 with the impact reducing device being arranged and constructed to reduce impacts of the fluid caused by change of direction of a flow of the fluid discharged from the first pump channel toward a first discharge port 24, with an unnumbered terminal end having the part 24 opposing to grooves 16a defined in the corresponding one of first and second surfaces of the impeller 16 such that the impact reducing device is arranged and constructed to gradually reduce a sectional area of the part of the terminal end in the rotational direction of the impeller, with the impact reducing device comprising a depth decreasing region disposed at one of the terminal ends of the first pump channels, with the depth decreasing region configured to gradually reduce the depth of the part of at least one of the terminal ends in the rotational direction, with the depth decreasing region comprising an inclined surface opposing to the grooves defined in the impeller, with the inclined surface being inclined in the rotational direction of the impeller, for the purpose of allowing fluid to be smoothly discharged from the discharge port, reducing the amount of fluid that collides with the terminal end of the discharge port and reducing noise.

It would have been further obvious at the time the invention was made to a person having ordinary skill in the art to form the modified impeller of AAPA Figures 23-24 such that it includes an impact reducing device of the form taught by Fuji, for the purpose of allowing fluid to be smoothly discharged from the discharge port, reducing the amount of fluid that collides with the terminal end of the discharge port and reducing noise. With regard to claim 6, which

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recites that each of the first discharge port and second discharge port have the impact reducing device in the form of the part opposing the groove in the first and second surfaces of the impeller, and claim 11, which recites that the depth decreasing region is an inclined surface opposing to the grooves defined in the first and second surfaces of the impeller, these are duplications of a known part for a known function. It would have been further obvious to provide the impact reducing device of Fuji on both the first and second discharge port of AAPA Figures 23-24, for the purpose of reducing the amount of fluid that collides with the terminal ends of both discharge ports and reducing noise, since it has been held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960).

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' Admitted Prior Art Figures 23-24 and European Patent 909,897 and Fuji 6,336,788 as applied to claim 2 above, and further in view of Rollwage 6,527,507. The modified impeller pump of AAPA Figures 23-24 shows all of the claimed subject matter except for a communication hole defined in the impeller that communicates between a pair of grooves defined in the first and second surface, and opposing to each other in the axial direction.

Rollwage (figures 1-3) shows a regenerative channel pump having a pump casing and an impeller 18 with communication holes 36 defined in the impeller that communicate between a pair of grooves 22 defined in a first and second surface of the impeller, and opposing to each

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other in the axial direction, for the purpose of providing a low or small force in the direction of the rotary axis with which the impeller is pressed against a sidewall of the casing.

It would have been further obvious at the time the invention was made to a person having ordinary skill in the art to form the modified impeller of AAPA Figures 23-24 such that the impeller includes a communication hole defined in the impeller that communicates between the pair of grooves defined in the first and second surfaces, and opposing to each other in the axial direction, as taught by Rollwage, for the purpose of providing a low or small force in the direction of the rotary axis with which the impeller is pressed against a sidewall of the pump casing.

Claims 14-15 and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' Admitted Prior Art Figures 23-24 and European Patent 909,897 and Fuji 6,336,788 and Rollwage 6,527,507. The rejection of claim 14 corresponds to the same grounds of rejection as applied to claim 12 above, and reference is made to the rejection of claim 12, above. The rejection of claims 15, 21, and 22 corresponds to the same grounds of rejection applied to claims 6, 10, and 11, respectively, set forth above.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Verdier whose telephone number is (571) 272-4824. The examiner can normally be reached on Monday-Friday from 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward K. Look can be reached on (571) 272-4820. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

C.V.  
November 21, 2006

  
Christopher Verdier  
Primary Examiner  
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